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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/033,201

12/27/2001

Ali R. Motamedi

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12/30/2003

AGILENT TECHNOLOGIES, INC.
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EXAMINER

AMARI, ALESSANDRO V

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 12/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/033,201

Applicant(s)

MOTAMEDI ET AL.

Examiner

Alessandro V. Amari

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 27-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 29-31 is/are allowed.
- 6) ☒ Claim(s) 1-6, 8, 27 and 28 is/are rejected.
- 7) ☒ Claim(s) 7 and 9-14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 27 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by DeVre et al US Patent 5,640,256.

In regard to claim 27, DeVre et al discloses (see Figures 1, 2, 7, 8, 13 and 14) a tunable optical filter comprising a plurality of electroholographic (EH) gratings (12) with different center wavelengths as described in column 8, lines 23-30 and column 10, lines 9-16, said EH gratings being optically connected such that an input optical signal can pass through at least one of said plurality of EH gratings as shown in Figures 2, 7 and 8, wherein said EH gratings are activated to filter said input optical signal in response to an applied voltage as described in as described in column 9, lines 27-33 and column 10, lines 9-16 and column 12, lines 34-41; wherein said EH gratings are tunable over a range of wavelengths in response to adjustments in the applied voltage as described in column 9, lines 1-67 and column 10, lines 1-16.

Regarding claim 28, DeVre et al discloses that the tunable wavelength ranges of said EH gratings combine to form a continuously tunable wavelength range as described in column 9, lines 1-67 and column 10, lines 1-16.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeVre et al US Patent 5,640,256 in view of Hamel et al US Patent 5,712,717.

In regard to claim 1, DeVre et al teaches (see Figures 1, 2, 7, 8, 13 and 14) a tunable optical filter or a method for filtering an optical signal comprising a plurality of electroholographic (EH) gratings (12) with different center wavelengths, said EH gratings being optically connected such that an input optical signal can pass through at least one of said plurality of EH gratings as shown in Figures 2, 7 and 8 wherein said EH gratings are activated to filter said input optical signal in response to an applied voltage as described in column 8, lines 60-67, column 9, lines 1-67, column 10, lines 1-16, and column 12, lines 4-63.

Regarding claim 2, De Vre et al discloses (see Figure 2, 7, 8, 14, 15) electrode pairs (14A, 14B, 78) associated with said EH gratings for applying voltage across EH gratings of a desired center wavelength to activate said EH gratings with said desired center wavelength; and a voltage controller (26, 92) associated with said electrode pairs for controlling the application of voltage across said EH gratings by the respective electrode pairs.

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Regarding claim 4, De Vre et al discloses that said EH gratings are tunable over a range of wavelengths in response to adjustments in the applied voltage as described in column 8, lines 60-67, column 9, lines 1-67 and column 10, lines 1-16 and column 12, lines 4-63.

Regarding claim 5, De Vre et al discloses that the tunable wavelength ranges of said EH gratings combine to form a continuously tunable wavelength range as described in column 8, lines 60-67, column 9, lines 1-67 and column 10, lines 1-16 and column 12, lines 4-63.

Regarding claim 6, De Vre et al discloses that at least two of said EH gratings having different center wavelengths are optically connected such that an input signal can pass through said at least two EH gratings in series as described in column 8, lines 60-67, column 9, lines 1-67 and column 10, lines 1-16 and column 12, lines 4-63 and as shown in Figure 7, 8, 13 and 14.

Regarding claim 8, De Vre et al discloses that said EH gratings are formed in photorefractive crystals as described in column 5, lines 40-44.

However, in regard to claim 1, DeVre et al does not teach that said plurality of EH gratings including EH gratings with different center wavelengths and EH gratings with the same center wavelengths. Also, in regard to claim 3, De Vre et al does not teach that the EH gratings of the same center wavelength are controlled simultaneously by said voltage controller.

In regard to claim 1, Hamel et al teaches a plurality of gratings including gratings with different center wavelengths and gratings with the same center wavelength as described in column 3, lines 14-21, column 5, lines 42-51 and column 6, lines 21-26.

Regarding claim 3, Hamel et al teaches that the EH gratings of the same center wavelength are controlled simultaneously by said voltage controller as described in column 3, lines 14-21, column 5, lines 42-51 and column 6, lines 21-26.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the plurality of gratings include gratings with different center wavelengths and gratings with the same center wavelengths as taught by Hamel et al for the filter of DeVre et al in order to improve the rejection level of particular wavelengths over a more extensive spectral range.

Allowable Subject Matter

5. Claims 29-31 are allowed.
6. Claims 7, 9, 10-14 and 29-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
7. Claims 7 and 29 are allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "an input birefringent element, located in an optical path that is before said plurality of EH gratings, for splitting said input optical signal into first and second polarized beams having different polarization states before said input optical signal passes through said plurality of EH gratings; wherein said plurality of EH gratings includes a first group of EH gratings having different center

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wavelengths that are optically connected such that said first polarized beam can pass through said first group of EH gratings and a second group of EH gratings having the same center wavelengths as said first group of EH gratings that are optically connected such that said second polarized beam can pass through said second group of EH gratings, said first and second polarized beams passing through the respective groups of EH gratings in parallel" as set forth in the claimed combination.

Claims 9 and 30 are allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "formed as a chirped EH grating that can be activated at different center wavelengths by applying different voltages across said chirped EH grating" as set forth in the claimed combination.

Claim 10 is allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "an input birefringent element, located in an optical path that is before said plurality of EH gratings, for splitting said input optical signal into first and second polarized beams having different polarization states before said input optical signal passes through said plurality of EH gratings; an input polarization rotator, located in an optical path that is between said input birefringent element and said plurality of EH gratings, for bringing said first and second polarized beams to the same polarization state; an output birefringent element, located in an optical path that is after said plurality of EH gratings, for combining said first and second polarized beams into an output signal after said first and second polarized beams have passed through said plurality of EH gratings; and an output polarization rotator, located in an optical path that is between said plurality of EH gratings and said output birefringent element, for

bringing said first and second polarized beams to different polarization states" as set forth in the claimed combination. Claims 11-13 are also allowable based upon their dependency on claim 10.

Claims 14 and 31 are allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "polarization rotators located between EH gratings that have the same center wavelength" as set forth in the claimed combination.

The prior art of record, De Vre et al and Hamel et al teaches filtering an optical signal comprising passing an optical signal through a series of electroholographic (EH) gratings with different center wavelengths, said EH gratings being activated in response to an applied voltage; and selectively applying a voltage across at least one of said EH gratings to activate said at least one EH grating, thereby filtering the optical signal at a desired center wavelength. Furthermore, De Vre et al teaches that adjusting and applying the voltage that is applied across said at least one EH grating tunes the center wavelength of at least one EH grating. De Vre in view of Norwood further teaches combining the filter elements in a series of sets each set of filter elements having different wavelength ranges than other sets of filter elements. DeVre et al in view of Hamel et al further teaches that the plurality of gratings includes gratings with different center wavelengths and gratings with the same center wavelengths. However, De Vre et al does not teach including input and output birefringent elements before and after the gratings or including an input polarization rotator located in the optical path between the input birefringent element and the gratings or that the plurality of EH gratings are

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included within a chirped grating and there is no motivation or teaching to modify this difference as derived.

Response to Arguments

8. Applicant's arguments with respect to claims 1-3 and 6-14 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments regarding claims 4, 5, and 27, 28, filed 21 October 2003 have been fully considered but they are not persuasive.

In regard to claims 4 and 27, Applicant argues, that the prior art of record, DeVre et al does not teach that the EH gratings are tunable over a range of wavelengths in response to adjustments in the applied voltage. Applicant further argues that the gratings of DeVre et al are turned "on" or "off" to filter light of a particular wavelength. Applicant cites Figure 12 where the center wavelengths are fixed at certain wavelengths with the only variable being whether the EH grating is turned "on" or "off".

In response to this argument, the Examiner directs the Applicant's attention to column 10, lines 11-16, which are reproduced below:

".... SVHOE 10 is in fact a dynamic filter. Additionally, the filter is a *multiple-wavelength device*, since any number of grating layers 12 can be active simultaneously. In other words, the filter of the invention is a device that can be electrically switched to filter one or *several wavelengths* at a time from a broad-band input signal, i.e., beam 18." (Italics Examiner's)

Clearly, the prior art teaches that the filter is dynamic and is a multiple wavelength device thus meeting the claim limitation that the gratings are tunable over a

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range of wavelengths in response to adjustments in the applied voltage. Furthermore, in column 13, lines 5-9, DeVre et al indicates that the Bragg wavelengths of the grating layers can be reprogrammed at any time so that the center wavelengths are not fixed as asserted by the Applicant.

In regard to claims 5 and 28, the Applicant argues that DeVre et al does not disclose gratings that combine to form a continuously tunable wavelength range and that DeVre et al discloses gratings that have different center wavelengths that are turned "on" or "off" and that the wavelength bands that are filtered by the activated EH gratings are separate and distinct from each other and do not form a continuously tunable wavelength range.

In response to this argument, the Examiner directs the Applicant's attention to column 10, lines 11-16 (reproduced above), which states that the filter is dynamic, and is a multiple wavelength device. Also, column 13, lines 5-9 of DeVre et al indicates that the Bragg wavelengths of the grating layers can be reprogrammed at any time. Furthermore, Figures 10C and 10D show that the filtering response is continuous over a range of wavelengths in that there is a Bragg selectivity response, which is uninterrupted (i.e., continuous) over the range shown.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alessandro V. Amari whose telephone number is (703) 306-0533. On January 20, 2004, the phone number will be changed to (571) 272-2306. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (703) 305-0024. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9318.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



DREW DUNN
SUPERVISORY PATENT EXAMINER

ava *ilv*
23 December 2003